REMARKS

A reconsideration of the present application, as amended, is respectfully requested.

Claims 1-3 and 17-22, as amended, are pending in the present application, of which claims 1, 17 and 20 are independent claims. Claim 1 is being amended to improve its clarity, and amended claim 1 is not drawn to new matter.

The Examiner has objected to the disclosure because of informalities on page 4, lines 9-11, where reference is made to three Japanese Laid-Open Patent Applications. The Examiner has correctly pointed out that a U.S. Patent Application corresponding to two of the referenced Japanese Patent Applications has been filed and has issued as U.S. Patent No. 6,697,167 B1. These informalities are being removed by the amendment to the paragraph on page 3, lines 6-10 of the Substitute Specification to reflect filing of the corresponding United States patent application and the issuance of U.S. Patent No. 6,697,167 B1 therefrom.

Claims 1-3, 17-19 and 20-22 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent No. 5,889,928 to Nakamura et al. (hereinafter "Nakamura") in view of U.S. Patent No. 5,978,506 to Murayama et al. (hereinafter "Murayama '506") and U.S. Patent No. 5,136,662 to Maruyama et al. (hereinafter "Maruyama '662").

Amended claim 1 has a first wherein clause reciting the requirement that "wherein said creation means creates the correction table based on a train of data generated by said reading means by reading plural gradient patterns outputted by said output means, and the plural gradient patterns outputted by said output means are disposed in point

symmetry with respect to a center position of the image . . ." This requirement is not taught or suggested by Nakamura, Murayama '506 or Maruyama '662.

As explained on page 13, lines 10-14 of the Substitute Specification of the present application, "[e]ven if the operator sets the sheet 400 [on which an image is to be printed] in an erroneous direction on the original table, the arrangement of the gradient patterns of the test output image as shown in Figs. 4 and 5 allows obtaining a result same as in a correct sheet setting, since the test output image is point symmetrical with respect to the center point 403." Because density characteristics of the output image data tend to vary in a spatially non-uniform manner as a result of environmental conditions, such as temperature and humidity, and degradation of certain image forming components over time, it is an important feature of the present invention to use a correction table created by reading gradient test patterns which are point symmetric with respect to a center position of the image, so as to minimize spatial variation of the density values of the output image data.

Nakamura teaches correction of gradation in an image output apparatus using a gradient correction table corresponding to a gradient correction curve derived from a train of data values obtained by scanning a test image. However, the reference fails to teach or suggest "plural gradient patterns . . . disposed in point symmetry with respect to center position of the image . . .," as called for in amended claim 1. The only test image disclosed in Nakamura is not point symmetric, as shown in Fig. 3 and described in col. 8, line 65-col. 9, line 11 of the reference.

Murayama '506 is directed solely to color balancing in a color image output system, such as a digital color copier or a digital color printer. As explained in col. 1, lines 21-27 of the reference, "[b]ecause . . . the above color-rendering process is known as

'subtract,' and substractive primary colors include cyan (C), magenta (M), yellow (Y) and black (K) . . ., a particular mixture of four substantially distinct primary color toner (i.e., a CMYK toner) renders a desired color." Murayama '506 shows in Fig. 5 and describes in col. 2, lines 24-34 that in order to render a desired color, the above-described CMY toner are appropriately superimposed. The colorant composition of the above-described superimposed CMY toner also varies over an intensity range. Because each of the CMY toner is impure, the combined composition ratio of the superimposed or mixed CMY toner is not substantially identical among the three colorant components. Furthermore, the amount of the above-described impurities of the CMY toner varies among manufacturers, toner products and even lots within the same product. Lastly, the relative composition of the toner may be unstable over an extended period of time. Therefore, color balancing to obtain a consistent faithful color image using a CMYK toner is a difficult problem.

However, because the same CMYK toner is superimposed in appropriate composition ratios to render the various colors of an entire image, the aforementioned variations of the colorant composition of superimposed CMY toner with intensity is spatially uniform. Although density characteristics of the substractive primary colors also vary in a spatially non-uniform manner, as indicated in the present application, correction of such spatially non-uniform variation in density characteristics is not addressed or mentioned in Murayama '506, since the teaching of that reference are confined to color balancing of an output image by using multiple color correction dithering tables, or the like, derived by scanning a test pattern. The test patterns taught by Murayama '506 are shown in Figs. 10A, 10B and 11 and described in col. 8, line 45-col. 9, line 25 of that reference. Although the test pattern shown in Fig. 11 of Murayama '506 appears to be point symmetric, no reason is given in the reference for having such a test pattern

arrangement other than a statement that "[b]ecause of this arrangement, either group of test patches [Type 1, 310 and Type 2, 320, or Type 2, 330 and Type 1, 340] on the test pattern output 300 may be placed on an image scanning surface for purpose of color balancing [so long as the test pattern output is placed at a predetermined position on the image scanning surface as indicated by the plus sign position markers 351-353]." The reference also does not describe the relative benefits or drawback of each of these exemplary list patterns in Figs. 10A, 10B and 11 of that reference. There is no mention or suggestion in Murayama '506 of using a point symmetric test pattern to derive a gradation correction table. Accordingly, Murayama '506 also fails to teach or suggest the requirements of the first wherein clause of amended claim 1.

Maruyama '662 teaches an image processor for sequential processing of successive regions of an image, and the reference does not mention correction of density characteristics of image data. Therefore, the reference also fails to teach or suggest the use of a correction table for correcting spatially nonuniform gradations by using "plural gradient patterns . . . disposed in point symmetry with respect to a center position of the image," as required by amended claim 1.

Amended claim 1 has a second wherein claim having the requirement of "wherein the correction table for correcting the image data read by the reading means is created by forming a smoothing process using some pieces of data whose number changes depending on the position of the data in the generated train of data." This requirement is also not taught or suggested by Nakamura, Murayama '506 or Maruyama '662.

Nakamura teaches a combination of correction curve refining procedures which could result in "smoothing" the correction curve. These procedures are referred to in Nakamura as: "correction to monotone increasing curve"; "correction of higher-

gradation zone" "correction to monotone increasing curve;" and "alleviate sudden change and gradation jump" (see Figs. 7, 9A-15B and col. 15, line 5-col. 19 of Nakamura). However, each of the aforementioned procedures taught by Nakamura for refining the correction curve require no more than three consecutive pieces of data (i.e., three consecutive input data values corresponding to three consecutive points on the correction curve), and the number of such pieces of data used by such procedures does not depend on the position of the input data value in a train or series of such data values generated by scanning the test image. Accordingly, Nakamura fails to teach or suggest "performing a smoothing process using some pieces of data whose number changes depending on the position of the data in the generated train of data," as required by amended claim 1.

Since there is no mention in Murayama '506 of any type of smoothing process, that reference also fails to teach or suggest the second additional requirement of amended claim 1.

Maruyama '662 also does not disclose or suggest creating any type of correction curve for correcting output image data, and, therefore also does not disclose or suggest any smoothing process for any such correction curve. Therefore, the reference also fails to teach or suggest the second additional requirement of amended claim 1.

For at least all of the foregoing reasons, amended claim 1 is patentable over Nakamura in view of Murayama '506 and Maruyama '662.

Claim 2 depends from amended claim 1 and is, therefore, patentable over Nakamura in view of Murayama '506 and Maruyama '662 for the same reasons as explained above for the patentability of amended claim 1 over those same three references.

Claim 3 also depends from amended claim 1 and is, therefore, also patentable over Nakamura in view of Murayama '506 and Maruyama '662 for the same

reasons as given above for the patentability of amended claim 1 over those same three references.

Claims 17, 18 and 19 are method claim counterparts of amended apparatus claim 1, and apparatus claims 2 and 3, respectively, each of claims 17, 18 and 19 having similar limitations to those recited in its counterpart apparatus claim. Accordingly, each of claims 17, 18 and 19 is patentable over Nakamura in view of Murayama '506 and Maruyama '662 for reasons similar to those set forth above for the patentability of each of amended claim 1, and claims 2 and 3, respectively, over those same three references.

Claims 20, 21 and 22 are computer program claim counterparts of amended apparatus claim 1, and apparatus claims 2 and 3, respectively, each of claims 20, 21 and 22 having similar limitations to those recited in its counterpart apparatus claim. For these reasons, claims 20, 21 and 22 are each patentable over Nakamura in view of Murayama '506 and Maruyama '662 for reasons similar to those explained above for the patentability of amended claim 1 and claims 2 and 3, respectively, over those same three references.

In light of the foregoing, applicant respectfully request allowance of amended claim 1, and claims 2, 3 and 17-22, and the passage of the present application to issue.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should be directed to our below listed address.

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